# EXHIBIT I

**Analysis of Infringement of U.S. Patent No. 6,725,402 by Silicon Laboratories, Inc.**
**(Based on Public Information Only)**

Plaintiff Ocean Semiconductor LLC ("Ocean Semiconductor"), provides this preliminary and exemplary infringement analysis with respect to infringement of U.S. Patent No. 6,725,402, entitled "METHOD AND APPARATUS FOR FAULT DETECTION OF A PROCESSING TOOL AND CONTROL THEREOF USING AN ADVANCED PROCESS CONTROL (APC) FRAMEWORK" (the "'402 patent) by Silicon Laboratories, Inc. ("SILABS"). The following chart illustrates an exemplary analysis regarding infringement by Defendant SILABS' semiconductor products, systems, devices, components, integrated circuits, and products containing such circuits, fabricated or manufactured using Applied Materials, Inc.'s ("Applied Materials") platforms, and/or framework, including Applied Materials' software and APC system, including the E3 platform hardware and/or software (collectively, "E3") and/or other APC system and platform hardware and/or software. Such products include, without limitation, wireless products (e.g., EFR32XG2X family), internet of things products (e.g., EFM8BB10F8G-QFN20, EFM8BB10F2A-QFN20, EFM8BB10F2G-QFN20, EFM8BB10F2I-QFN20, EFM8BB10F4A-QFN20, EFM8BB10F4G-QFN20, EFM8BB10F4I-QFN20, EFM8BB10F8A-QFN20, EFM8BB10F8G-QSOP24, EFM8BB10F8G-SOIC16, EFM8BB10F8I-QFN20, EFM8BB10F8I-QSOP24, EFM8BB10F8I-SOIC16, EFM8BB21F16A-QFN20, EFM8BB21F16G-QFN20, EFM8BB21F16G-QSOP24, EFM8BB21F16I-QFN20, EFM8BB21F16I-QSOP24, EFM8BB22F16A-QFN28, EFM8BB22F16G-QFN28, EFM8BB22F16I-QFN28, EFM8BB31F16A-4QFN24, EFM8BB31F16A-5QFN32, EFM8BB31F16G-QFN24, EFM8BB31F16G-QFN32, EFM8BB31F16G-QFP32, EFM8BB31F16G-QSOP24, EFM8BB31F16I-4QFN24, EFM8BB31F16I-5QFN32, EFM8BB31F16I-QFN24, EFM8BB31F16I-QFN32, EFM8BB31F16I-QFP32, EFM8BB31F16I-QSOP24, EFM8BB31F32A-4QFN24, EFM8BB31F32A-5QFN32, EFM8BB31F32G-QFN24, EFM8BB31F32G-QFN32, EFM8BB31F32G-QFP32, EFM8BB31F32G-QSOP24, EFM8BB31F32I-4QFN24, EFM8BB31F32I-5QFN32, EFM8BB31F32I-QFN24, EFM8BB31F32I-QFN32, EFM8BB31F32I-QFP32, EFM8BB31F32I-QSOP24, EFM8BB31F64A-4QFN24, EFM8BB31F64A-5QFN32, EFM8BB31F64G-QFN24, EFM8BB31F64G-QFN32, EFM8BB31F64G-QFP32, EFM8BB31F64G-QSOP24, EFM8BB31F64I-4QFN24, EFM8BB31F64I-5QFN32, EFM8BB31F64I-QFN24, EFM8BB31F64I-QFN32, EFM8BB31F64I-QFP32, EFM8BB31F64I-QSOP24), infrastructure products (e.g., Si5332A-GM1, Si5332A-GM2, Si5332A-GM3, Si5332B-GM1, Si5332B-GM2, Si5332B-GM3, Si5332C-GM1, Si5332C-GM2, Si5332C-GM3, Si5332D-GM1, Si5332D-GM2, Si5332D-GM3, Si5332E-GM1, Si5332E-GM2, Si5332E-GM3, Si5332F-GM1, Si5332F-GM2, Si5332F-GM3, Si5332G-GM1, Si5332G-GM2, Si5332G-GM3, Si5332H-GM1, Si5332H-GM2, Si5332H-GM3, Si5332A-GM1, Si5332A-GM2, Si5332A-GM3, Si5332B-GM1, Si5332B-GM2, Si5332B-GM3, Si5332C-GM1, Si5332C-GM2, Si5332C-GM3, Si5332D-GM1, Si5332D-GM2, Si5332D-GM3, Si5332E-GM1, Si5332E-GM2, Si5332E-GM3, Si5332F-GM1, Si5332F-GM2, Si5332F-GM3, Si5332G-GM1, Si5332G-GM2, Si5332G-GM3, Si5332H-GM1, Si5332H-GM2, Si5332H-GM3), broadcast products (e.g., Si2160, Si2162, Si2164, Si2180, Si2181, Si2182, Si2183), access products (e.g., Si3000, Si3402-GM, Si3404-GM, Si3406-GM, Si34062-GM, Si3462-GM, Si3471A-IM, microcontrollers (e.g., Tiny Gecko series, EFM8 Busy Bee), buffers (e.g., Si5330x), oscillators (e.g., Si54x), clock generators (e.g., Si534x), jitter attenuators (e.g., Si539x), synchronous ethernet (e.g., Si5383/48/88), isolation products (e.g., Si86xx, Si87xx, Si88xx, Si823x, Si827x, Si828x, Si823Hx, Si890x, Si892x, Si82Hx, Si838x, Si834x, and Si875x), interface products (e.g., ethernet controllers, LC controllers, bridges), timing products (e.g., buffers, clock generators, oscillators, and network synchronizers), sensors (e.g., humidity, magnetic, optical, temperature, and biometric), audio & radio products (e.g., automotive tuners, and radios), power products (e.g., power management ICs, powered drivers, and PSE controllers), TV & video products (e.g., digital demodulators and TV tuners),

modem & DAA products (e.g., voice modems), voice products (e.g., codec, proSLICs, and DAA), power over ethernet devices (e.g., power source equipment and powered device ICs)), and similar systems, products, devices, and integrated circuits (collectively, the "'402 Infringing Instrumentalities").

The analysis set forth below is based only upon information from publicly available resources regarding the '402 Infringing Instrumentalities, as SILABS has not yet provided any non-public information.

Unless otherwise noted, Ocean Semiconductor contends that SILABS directly infringes the '402 patent in violation of 35 U.S.C. § 271(g) by using, selling, and/or offering to sell in the United States, and/or importing into the United States, the '402 Infringing Instrumentalities. The following exemplary analysis demonstrates that infringement. Unless otherwise noted, Ocean Semiconductor further contends that the evidence below supports a finding of indirect infringement under 35 U.S.C. § 271(b) in conjunction with other evidence of liability.

Unless otherwise noted, Ocean Semiconductor believes and contends that each element of each claim asserted herein is literally met through SILABS' provision or importation of the '402 Infringing Instrumentalities. However, to the extent that SILABS attempts to allege that any asserted claim element is not literally met, Ocean Semiconductor believes and contends that such elements are met under the doctrine of equivalents. More specifically, in its investigation and analysis of the '402 Infringing Instrumentalities, Ocean Semiconductor did not identify any substantial differences between the elements of the patent claims and the corresponding features of the '402 Infringing Instrumentalities, as set forth herein. In each instance, the identified feature of the '402 Infringing Instrumentalities performs at least substantially the same function in substantially the same way to achieve substantially the same result as the corresponding claim element.

Ocean Semiconductor notes that the present claim chart and analysis are necessarily preliminary in that Ocean Semiconductor has not obtained substantial discovery from SILABS nor has SILABS disclosed any detailed analysis for its non-infringement position, if any. Further, Ocean Semiconductor does not have the benefit of claim construction or expert discovery. Ocean Semiconductor reserves the right to supplement and/or amend the positions taken in this preliminary and exemplary infringement analysis, including with respect to literal infringement and infringement under the doctrine of equivalents, if and when warranted by further information obtained by Ocean Semiconductor, including but not limited to information adduced through information exchanges between the parties, fact discovery, claim construction, expert discovery, and/or further analysis.

| USP 6,725,402 | Infringement by the '402 Accused Instrumentalities |
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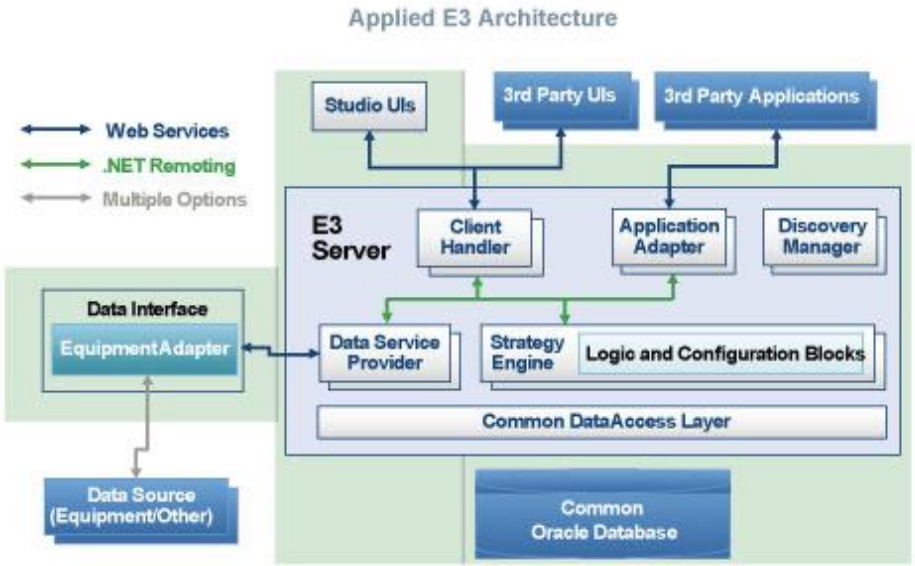
| 1. A method comprising: receiving at a first interface operational state data of a processing tool related to the manufacture of a processing piece; | To the extent that the preamble of Claim 1 is a limitation, the Applied Material E3 system, which is used to fabricate or manufacture the '402 Infringing Instrumentalities, receives at a first interface operational state data of a processing tool related to the manufacture of a processing piece.<br><br>For example, the Applied Material E3 system has a data interface that is connected to an equipment adapter that communicates with a data sensor connected to a processing tool (e.g., equipment) as shown below:<br><br>  <br><br><br>*See* Applied E3, Automation Products Group webpage, *available at* https://www.brookssoftware.jp/products/e3/catalog.html (last visited Oct. 12, 2020).<br><br>Within an Advanced Processing Control ("APC") system such as Applied E3, fault detection is understood as "[t]he technique of monitoring and analyzing variations in tool and/or process data to detect anomalies."<br><br>*See* James Moyne and Jimmy Iskandar, *Big Data Analytics for Smart Manufacturing: Case Studies in Semiconductor Manufacturing*, 5 PROCESSES 20 (2015), *available at* https://www.mdpi.com/2227-9717/5/3/39 (last visited Oct. 12, 2020). |

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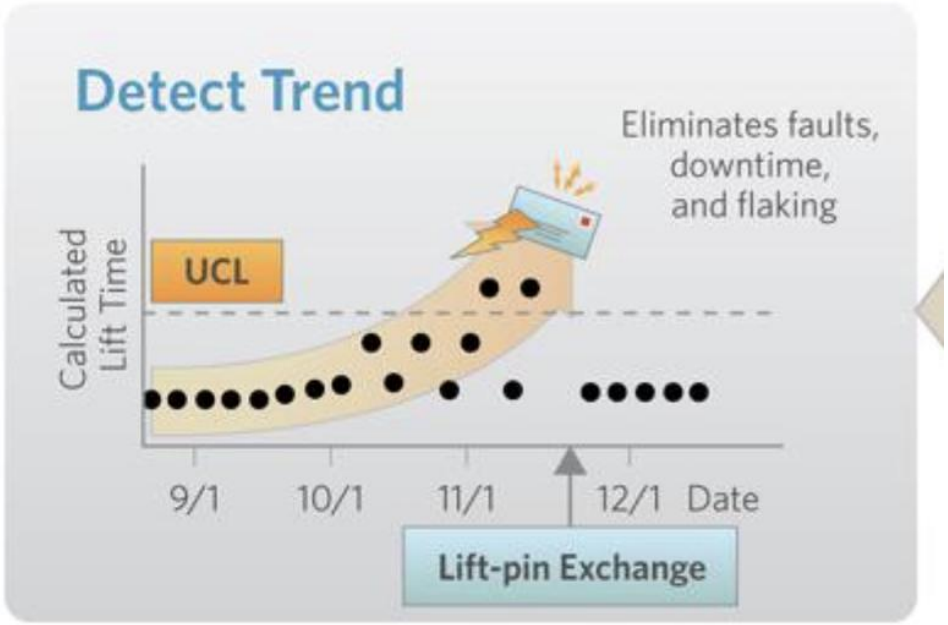
| | Also, the Applied Material E3 system has an interface for receiving operational data from a processing tool for semiconductor manufacture, *e.g.* a lift-pin exchange, as shown below:<br>  <br><br>*See* James Moyne, "Challenges, Opportunities in Advanced Process Control To Be Addressed at 27th Annual U.S. APC Conference" *available at* http://www.appliedmaterials.com/nanochip/nanochip-fab-solutions/september-2015/challenges-opportunities-in-apc (last visited Oct. 12, 2020).<br><br>Also, the Applied Material E3 system utilizes data from a sensor on a processing tool to provide data to its fault detection system. For example: "Features > Fault detection analysis environment for creating statistics and limits from tool sensor data." *See* "Applied E3 Fault Detection and Classification Module," at 1, *available at* http://www.appliedmaterials.com/files/E3FDCDatasheet.pdf (last visited Oct. 12, 2020) ("Applied E3 FDC Datasheet"). |
| sending the state data from the first interface to a fault detection unit, wherein the act of | The Applied Material E3 system, which is used to fabricate or manufacture the '402 Infringing Instrumentalities, sends the state data from the first interface to a fault detection unit, wherein the act of sending comprises: sending the state data from the first interface to a data collection unit, and accumulates the state data at the data collection unit. |

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| sending comprises: sending the state data from the first interface to a data collection unit; accumulating the state data at the data collection unit; | For example, the Applied Material E3 system's Fault Detection and Classification ("FDC") module receives and accumulates data from a processing tool, as shown below:<br><br>"Solution Description The Applied E3 FDC module is the only fault detection and analysis solution in the market today built on a common platform with integration to statistical process control (SPC), equipment performance tracking (EPT), run to run (R2R) control and advanced data mining (ADM). The FDC module continuously monitors equipment sensors and events against performance metrics using statistical analysis techniques, and provides proactive and rapid feedback on equipment health. Using the E3 FDC module, engineers can analyze sensor data from manufacturing equipment, detect out-of-norm conditions and relate them to problems with tools."<br><br>*See* Applied E3 FDC Datasheet, *available at* http://www.appliedmaterials.com/files/E3FDCDatasheet.pdf (last visited Oct. 12, 2020). |
| translating the state data from a first communications protocol to a second communications protocol compatible with the fault detection unit; | The Applied Material E3 system, which is used to fabricate or manufacture the '402 Infringing Instrumentalities, translates the state data from a first communications protocol to a second communications protocol compatible with the fault detection unit.<br><br>For example, the Applied Material E3 system permits the use of different protocols in its FDC, as the following table illustrates: |

**Table 1. Data Connection Types**

| Connection Type | Relative Ease | Comment |
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| SECS/GEM | Easy | Most common connection in semi front end. Shared connection with equipment automation program. |
| Interface A | Easy | Second most common connection. Ability to host multiple applications. |
| OPC | Easy | Used in industrial and subfab applications, PLCs, etc. |
| TCP/IP | Easy | Needs DLL for each connected device. |
| Flat File/Binary File | Easy | FDC supports via ODI. |
| TIBCO | Easy | FDC driver available. |
| ODP | Moderate | Data systems protocol. Requires custom DLL. |

*See* Ben Williams et al., "Advancing Advanced Process Control in Backend Factories," at 4, *available at* http://www.appliedmaterials.com/files/Advancing_Advanced_Process_Control_in_Backend_Factories.pdf (last visited Oct. 12, 2020) ("Advancing Advanced Process Control in Backend Factories").

Also, the Applied Material E3 system's FDC relies on an FDC Equipment Adapter to translate between the SECS protocol used by a piece of equipment and the TCP/IP protocol used to send information from the FDC to another system, as shown below:

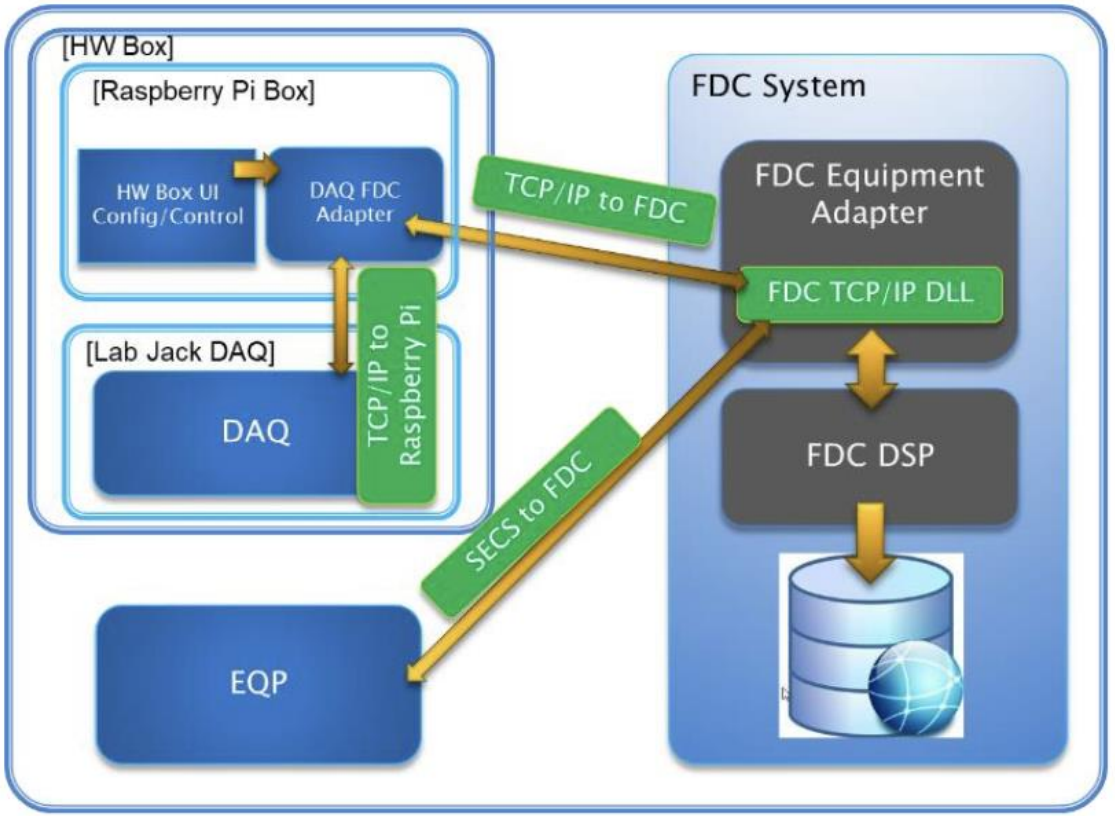


**Figure 6. TCP/IP Connection Using Raspberry Pi**

*See id.*

The Applied Material E3 system can also be configured to receive different protocols from a sensor attached to a tool and from the tool itself. The FDC is able to translate between these protocols.

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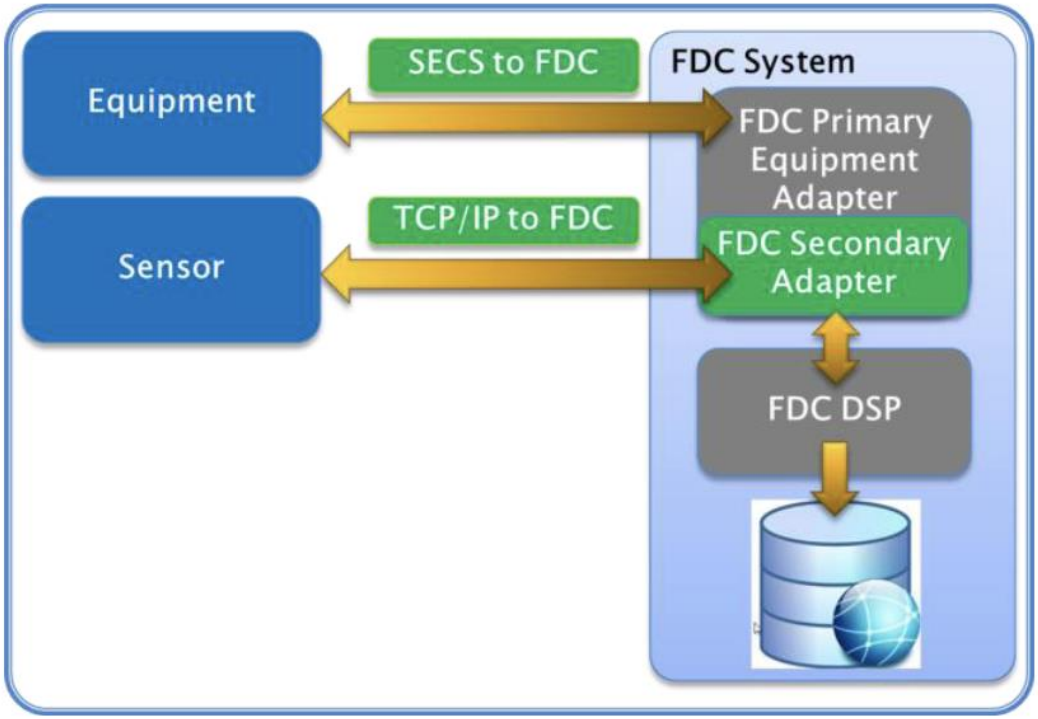
| |  <br>*See id.* |
| and sending the translated state data from the data collection unit to the fault detection unit; | The Applied Material E3 system, which is used to fabricate or manufacture the ’402 Infringing Instrumentalities, sends the translated state data from the data collection unit to the fault detection unit.<br><br>For example, in the Applied Material E3 system, translated state data is sent from the FDC Equipment Adapter or from the FDC Primary and Secondary Equipment Adapters to the FDC Digital Signal Processor (“DSP”), as shown below: |

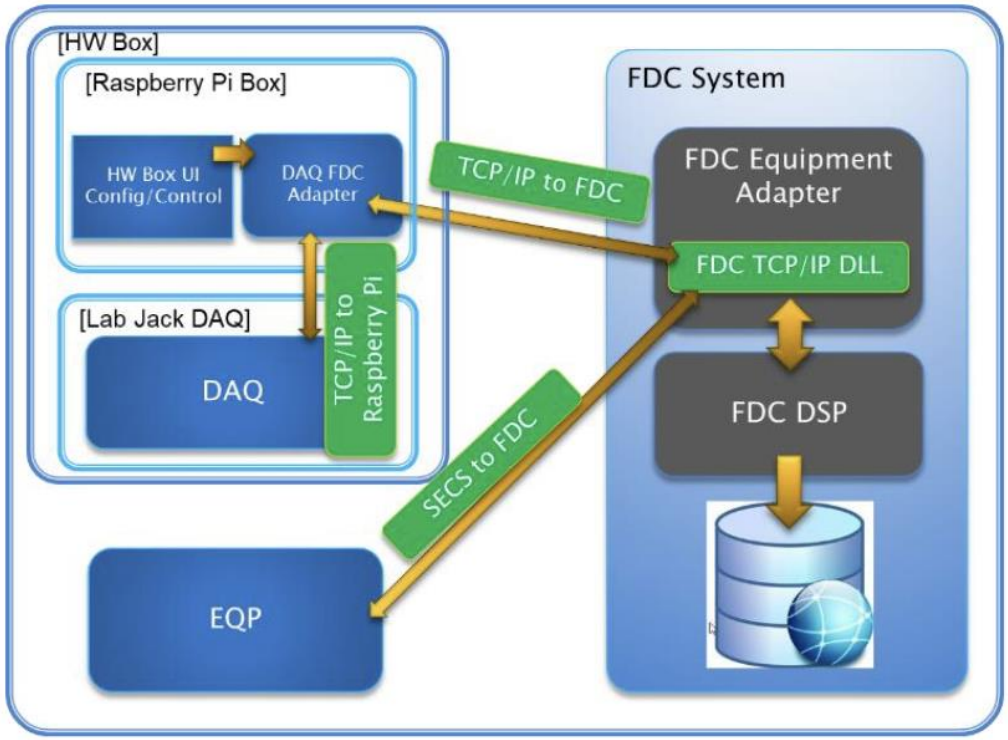



**Figure 6. TCP/IP Connection Using Raspberry Pi**

*See* Advancing Advanced Process Control in Backend Factories, at 4.

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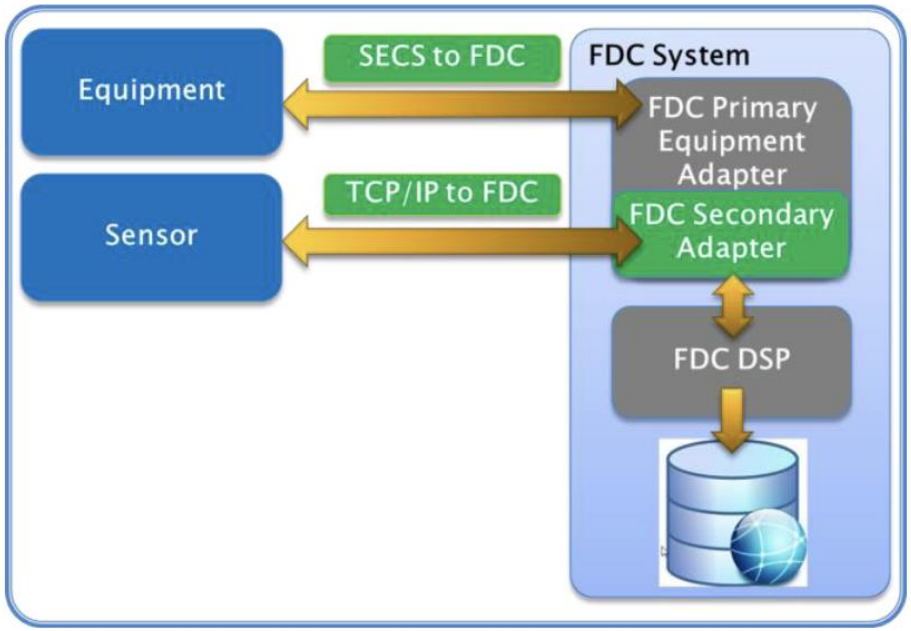
| |  <br>*See id.* |
| determining if a fault condition exists with the processing tool based upon the state data received by the fault detection unit; | The Applied Material E3 system, which is used to fabricate or manufacture the '402 Infringing Instrumentalities, determines if a fault condition exists with the processing tool based upon the state data received by the fault detection unit.<br><br>For example, the Applied Material E3 system's FDC is capable of identifying faults based on information received from the processing tool. The E3 FDC strategy engine provides tools for analyzing received data, as shown below:<br><br>"Detect and Diagnose. Engineers can construct classification models to define root cause based on fault detection alarms with the E3 FDC strategy engine. This strategy engine provides a dashboard with extensive tools for analyzing various data sources. With the dashboard, engineers can drag and drop data collections into data views, reuse previous analysis templates, access all types of data in the repository and add comments to run data. The FDC solution also provides a vast library of univariate and multivariate analysis tools for developing detailed diagnostic models. These models can detect problems with equipment and provide predictive maintenance capabilities that reduce unscheduled downtime and product scrap. The strategy engine also includes support for limits management and offers extensive data filtering capabilities to |

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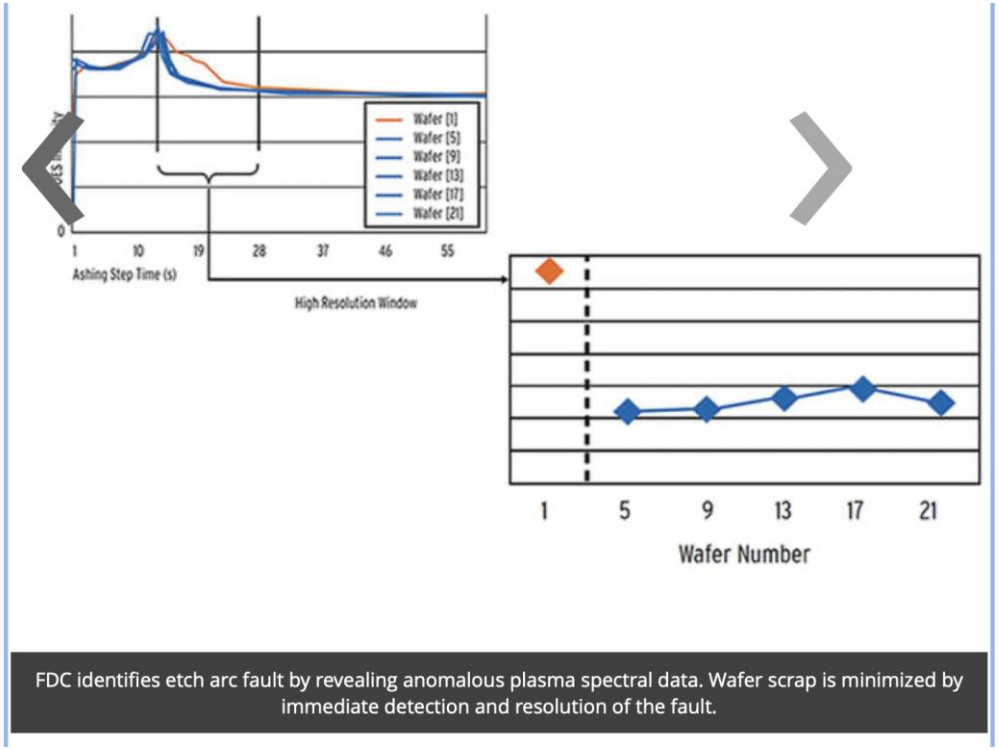
| | eliminate false positives."<br><br>*See* Applied E3 FDC Datasheet, *available at* http://www.appliedmaterials.com/files/E3FDCDatasheet.pdf (last visited Oct. 12, 2020). |
| performing a predetermined action on the processing tool in response to the presence of a fault condition; | The Applied Material E3 system, which is used to fabricate or manufacture the '402 Infringing Instrumentalities, performs a predetermined action on the processing tool in response to the presence of a fault condition.<br><br>For example, the Applied Material E3 system's FDC will take action to resolve a fault revealed by the system. As shown below, E3 FDC may immediately resolve a fault once detected:<br><br>  <br><br>FDC identifies etch arc fault by revealing anomalous plasma spectral data. Wafer scrap is minimized by immediate detection and resolution of the fault.<br><br>*See* "Applied SmartFactory Fault Detection and Classification," *available at* http://www.appliedmaterials.com/global-services/automation-software/e3-fault-detection-and-classification-fdc (last visited Oct. 12, 2020) ("Applied SmartFactory Fault Detection and Classification"). |

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| and sending an alarm signal indicative of the fault condition to an advanced process control framework from the fault detection unit providing that a fault condition of the processing tool was determined by the fault detection unit, wherein performing a predetermined action further comprises sending a signal by the framework to the first interface reflective of the predetermined action. | The Applied Material E3 system, which is used to fabricate or manufacture the '402 Infringing Instrumentalities, sends an alarm signal indicative of the fault condition to an advanced process control framework from the fault detection unit providing that a fault condition of the processing tool was determined by the fault detection unit, wherein performing a predetermined action further comprises sending a signal by the framework to the first interface reflective of the predetermined action.<br><br>For example, the Applied Material E3 system's FDC uses fault detection alarms to identify faults:<br><br>"Detect and Diagnose. Engineers can construct classification models to define root cause based on fault detection alarms with the E3 FDC strategy engine. This strategy engine provides a dashboard with extensive tools for analyzing various data sources. With the dashboard, engineers can drag and drop data collections into data views, reuse previous analysis templates, access all types of data in the repository and add comments to run data. The FDC solution also provides a vast library of univariate and multivariate analysis tools for developing detailed diagnostic models. These models can detect problems with equipment and provide predictive maintenance capabilities that reduce unscheduled downtime and product scrap. The strategy engine also includes support for limits management and offers extensive data filtering capabilities to eliminate false positives."<br><br>*See* Applied E3 FDC Datasheet, *available at* http://www.appliedmaterials.com/files/E3FDCDatasheet.pdf (last visited Oct. 12, 2020).<br><br>Also, the Applied Material E3 system's FDC is proactive fault detection system that is designed to be used with other components of an advanced process control system.<br><br>"Solution Description The Applied E3 FDC module is the only fault detection and analysis solution in the market today built on a common platform with integration to statistical process control (SPC), equipment performance tracking (EPT), run to run (R2R) control and advanced data mining (ADM). The FDC module continuously monitors equipment sensors and events against performance metrics using statistical analysis techniques, and provides proactive and rapid feedback on equipment health. Using the E3 FDC module, engineers can analyze sensor data from manufacturing equipment, detect out-of-norm conditions and relate them to problems with tools."<br><br>*See id.*<br><br>*See* Seong-Hoon Lee and Scott Bushman, *PECVD Vacuum Integrity Application Enhances Display Manufacturers' Throughput and Yield*, NANOCHIP FAB SOLUTIONS, vol. 5, n. 2 at 19 (2010), *available at* http://www.appliedmaterials.com/files/nanochip-journals/nanochip-fab-solutions-december-2010.pdf (last visited Oct. 12, 2020): |

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| | “The E3 fault detection and classification (FDC) module is the software backbone for collecting and integrating tool data, such as sensor readings and events, into a common Oracle database. This enables other E3 modules to access this data.” |